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Six Species of Bugs New to the Virginia List (Heteroptera: Coreidae, Lygaeidae, Phymatidae, Miridae)

Richard L. Hoffman

Virginia Museum of Natural History
Martinsville, Virginia 24112

INTRODUCTION

Ongoing inventory of the arthropods of Virginia conducted by the Virginia Museum of Natural History (VMNH) and the Virginia Division of Natural Heritage, Department of Conservation & Recreation (VDNH), has resulted in the addition of numerous species to the fauna of the Commonwealth as currently recorded. A substantial number have already been documented in previous issues of *Banisteria*, and this occasion is taken to augment the list of Heteroptera

COREIDAE

My summary of Virginia coreids (1975) accounted 15 species known from Virginia at that time, with the

likely occurrence here of six others. In 1992 I added *Acanthocephala declivis* and a few years later (1994) formally proposed to delete *Chelinidea vittiger*, thus maintaining the base number of 15. It is now possible to make a modest increase with a capture that confirms one of the "probables" listed in the original account.

***Ceraleptus americanus* Stal**

In preparing my treatment of coreids in 1973-74, I overlooked Froeschner's (1963) synopsis of *Ceraleptus*, and mistakenly considered Raleigh, North Carolina, to be the northernmost point in the range of *C. americanus*, probably because Blatchley cited specimens from Florida and Indiana as being "...the only records from east of the Mississippi." Froeschner added Mississippi, Louisiana,

and the District of Columbia to the list. The most recent statement about distribution is in the catalog of North American Heteroptera (Henry & Froeschner, 1988), in which New York is added to the list of eastern states of record. Dr. Henry advises me (in litt.) that the inclusion of New York is based on a record for "Long Island" by H. B. Weiss (1916) in an obscure reference overlooked by Blatchley. The range as currently known thus extends from Long Island to northern Florida, thence west to California, and northward to Indiana, Missouri, and Utah (whether continuous or disjunctly is not known). The species is certainly not easy to collect, and many of the state occurrences are based on single captures only.

Virginia can now be entered in the states of record for *americanus*, on the basis of a single specimen (VMNH) taken in a Malaise trap operated by David R. Smith at a site 1.4 km south of Dunnsville, Essex Co., Virginia, during a two-week trapping interval ending on 11 April 1991. Processing of the enormous collection presented to the museum by Dr. Smith has included so far 15 or 20 samples from that site, but that only the single *americanus* has been recovered suggests that the specimen was merely a transient rather than a local resident. The preferred habitat of the species seems not to be known.

That only four localities are known for Florida (Baranowski & Slater, 1986), in which insects have been collected as intensely as anywhere else in the country, may reflect actual rarity, perhaps of a species in advanced decline with only marginal, widely dispersed populations, still surviving.

My 1975 treatment relied upon a technical distinction in wing venation to separate Pseudophloeinae, and *Ceraleptus*, from the other two subfamilies of coreids in Virginia. For quick recognition of *C. americanus*, the dense pronotal granules, each with an erect seta, provide an easy character to see. The general habitus is that of a small *Anasa*, except for the somewhat incrassate metafemora with several sharp ventral spines.

LYGAEIDAE (RHYPAROCHROMIDAE)

My 1996 treatment of the Virginia seed bugs accounted 68 confirmed species for the state, and included eight others whose known ranges made them likely candidates for future in-state discovery. One of the eight has in fact turned up, as well as another whose capture represents such an enormous range extension that the species would never have been anticipated to occur here.

The classical family Lygaeidae was divided by Henry (1997) into 11 families, an action which has not yet been endorsed by all heteropterists. Following the new arrangement, the two taxa treated below would be placed in the Rhyparochromidae.

Botocudo modestus (Banks)

One reliable way to increase the membership in any group of local organisms is to publish a supposedly complete list for the region. Shortly thereafter additional species begin to show up, some of them even having been already present in one's unsorted backlog. For many kinds of arthropods, the newcomers may be so far out of their known ranges as to have never even merited consideration as "probables".

The smaller forms of lygaeid bugs provide numerous examples of unlikely captures, often hundreds of miles removed from the nearest known locality. One such case is that of *Tempyra biguttula* (Stal): known from Kansas, Missouri, and Texas, with a few specimens also taken at Plummers Island, Maryland. *Botocudo modestus* provides another interesting local example of a similar, somewhat enigmatic, disjunction. On 20 July 1994, a pair of adult specimens was captured in a pitfall operated by C. S. Hobson (VDNH) on the north side of Wallops Island, Accomack Co., Virginia. During preparation at VMNH, I recognized them as a species related to *Antillocoris*, but was unable to make a generic placement. The male was sent to Professor Slater, who reported, with some reservation, that it was apparently *B. modestus*.

Botocudo is a Neotropical genus in the tribe Antillocorini, with two species represented in the United States. Of these, *B. delineatus* ranges from Texas and California to Panama, while *modestus* has been known from Arkansas and Missouri, westward to California. The distance from Missouri to Wallops Island is on the order of 1000 miles (1600 km). The fact that two brachypterous adults were trapped certainly implies an established population. Less certain is the origin of the population. Is it an extreme disjunct from a former continent-wide distribution, or just one located by serendipitous capture of a small, secretive bug that occurs widely in eastern North America in some rarely sampled biotope? A perhaps less plausible possibility is that of accidental introduction in materials transported to the Wallops Island NASA base from a related facility in one of the more western states.

Botocudo modestus is in the same size range as the local species of *Antillocoris* (i. e., 2 - 3 mm long). The character used in my 1996 definition of *Antillocoris* (and Antillocorini) - the offset in the posterior edge of the hemelytral corium - does not occur in brachypterous specimens, and is very hard to see even when it is present in fully-winged specimens. For all practical purposes, the conspicuous difference between our two local genera is the shape of the pronotum: subquadrate in *Botocudo*, conspicuously narrowed anteriorly in *Antillocoris* (see drawings). *B. modestus* is dorsally piceous to black

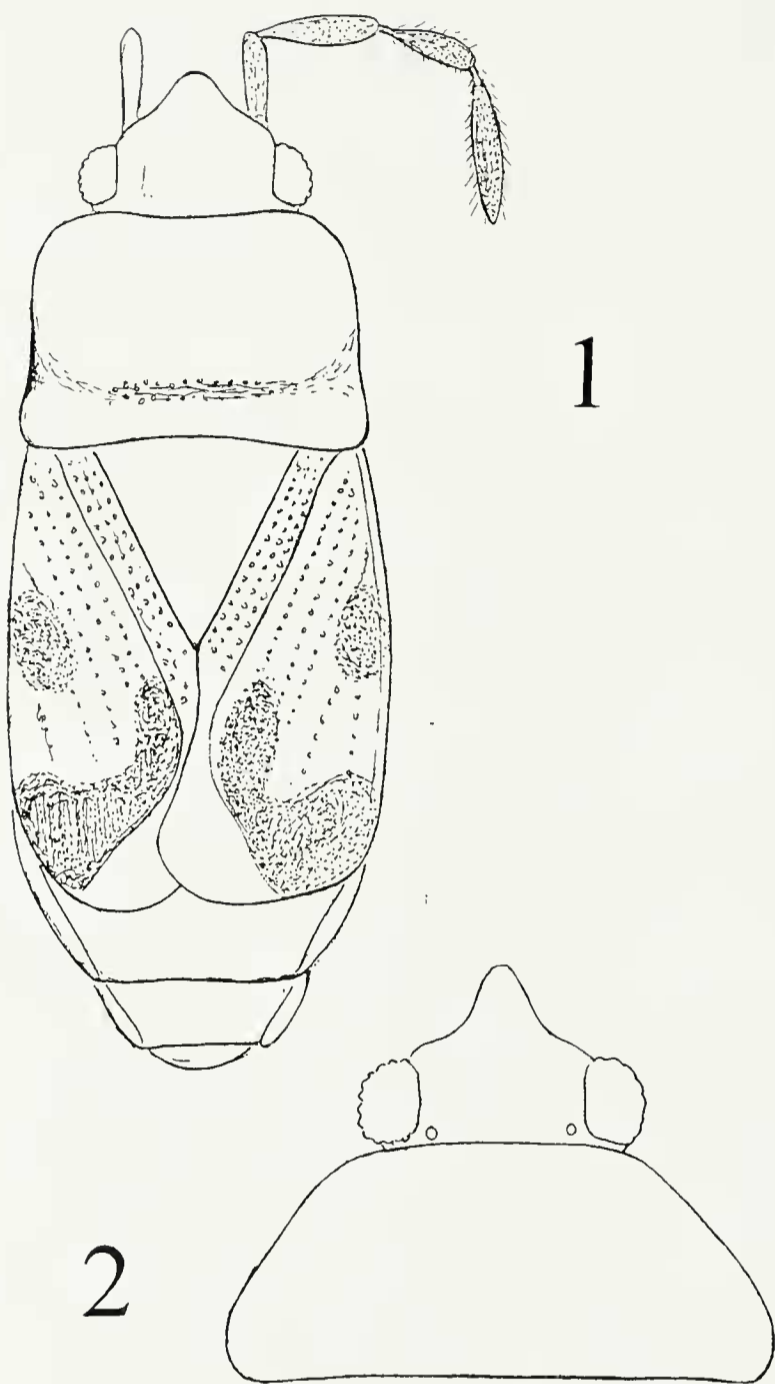


Fig. 1. *Botocudo modestus* (Banks), showing body shape and coloration. Fig. 2. Pronotum of *Antillocoris discretus* Barber, showing trapezoidal outline.

overall, with the elytra testaceous-beige, each with two poorly-defined darker spots. The head and pronotum are smooth and polished, the scutellum finely granular and not quite so dark as the forebody (Fig. 1).

During the summer and Fall of 1998, staff of the Division of Natural Heritage conducted intensive surveys of the arthropod fauna of Assateague Island, only three miles/five km north of Wallops Island and presumably with essentially similar biotopes. Not a single specimen of *Botocudo* was secured, despite collecting techniques that included black-lighting, Malaise traps, and pitfalls.

Drymus unus (Say)

As recently as 1996, I had not seen an authentic Virginia specimen of this miniature version of the common *Drymus crassus*, although records for North Carolina and Maryland certainly implicated *unus* as a probable resident of this state. Now two specimens are at hand which confirm that probability, and raise the number of confirmed "lygaeids" from 68 to 70.

Floyd Co.: Buffalo Mountain, ca. 3500 ft., 23 October 1996, from berleseate extraction of deciduous forest litter, VMNH survey (1). *Louisa Co.*: four miles south of Cuckoo, 29 August-5 September 1986, Malaise trap, David R. Smith leg. et don. (1).

These individuals agree closely with Connecticut material provided by Prof. Slater, and confirm the diagnostic characters stipulated in my key (1996: 45) with the reservation that the supposed difference in pronotal punctation is perhaps too subjective to be reliable. But an additional, previously overlooked, distinction is the bicolored apical antennomere in *unus*: proximally dark brown, distally light testaceous-yellow (vs. uniformly dark brown in *crassus*). If confirmed in larger series, this feature will be helpful in separating members of these very closely similar species.

PHYMATIDAE

Lophoscutus prehensilis prehensilis (Fabricius)

The northernmost locality for this subtropical ambush bug reported in the literature appears to be that of Brimley (1938) for Southern Pines, North Carolina. Despite extensive field work in extreme southeastern Virginia during the past decade, this species escaped detection until 1993, when it was taken at two localities in the Hampton Roads area by Dr. Barbara J. Abraham.

Poquoson City: Big Salt Marsh, NASA Plum Tree Island Test Site, 15 May 1993 (1). *Hampton City*: Grandview Wildlife Preserve, 1 May 1993 (1). Dr. Abraham collected the specimens while sweeping low vegetation for spiders, and recognized them as unusual.

These records extend the documented range of *prehensilis* approximately 212 miles (330 km) north-eastward along the Atlantic Coastal Plain.

MIRIDAE

Teratocoris discolor Uhler

The Henry & Froeschner catalog (1988: 388) records this species from most of the Canadian provinces - British

Columbia to Quebec - and from the states of Colorado, Illinois, Indiana, Iowa, Massachusetts, Michigan, Missouri, New York, Ohio, and Utah. A distinctly subboreal distribution is thus implied, with a southward extension along the Rockies.

It was therefore a matter of some concern when a small series of mirids taken in extreme southeastern Virginia was identified convincingly as *Teratocoris*, and with some reservation as *T. discolor*, in Blatchley's manual. Not only is the Virginia population disjunct far southward, it inhabits a biotope (oceanic dunes) rather different from those available in the cohesive part of the range.

The material at hand (VMNH 3, USNM 1) was collected in False Cape State Park, Virginia Beach City, 18-21 May, 1998, by a VDNH team composed of S. M. Roble, J. C. Ludwig, C. S. Hobson, and A. C. Chazal. The specimens were taken by blacklight trapping near the Wash Woods Environmental Education Center. This locality is sufficiently remote to rule out any likelihood of accidental introduction from a more northern source, and Dr. Henry, who kindly confirmed the identification, advised me (in litt.) that the USNM collection has material from Maryland - substantiating the natural presence of *discolor* in the Middle Atlantic states.

Nonetheless, this extension of the known range along the Atlantic coastline, rather than down the higher Appalachians, is noteworthy, and brings to mind a somewhat similar pattern noted by Hoffman & Parker (1997) for a northern caddisfly, *Limnephilus moestus* (Banks), which occurs also in the Coastal Plain from New Jersey to Lake Waccamaw, North Carolina. An additional parallel has been recorded (Cross, 1972) for the dytiscid beetle *Hygrotus impressopunctatus* Schaller, a Holarctic species occurring across North America to New York and Pennsylvania, and disjunctly down the coast to Chincoteague Island, Accomack Co., Virginia.

***Tytthus alboornatus* Knight**

This minuscule mirid has heretofore been recorded only from New York and Florida. Its recent discovery in Virginia does not constitute a range extension, but does fill in a major lacuna, and establishes the species further inland than previously known. VMNH has specimens from two sites:

Virginia Beach City: Dam Neck Naval Base, "dune drift fence site", 10-25 June 1991, VDNH survey by K. A. Buhlmann (1). *Mecklenburg Co.*: Elm Hill Wildlife Management Area, 11-29 May 1995, VMNH survey (4).

The specimens from Elm Hill WMA were taken in a two-bucket pitfall-drift fence array set in a former cultivated field, about 50 feet from the edge of the

Roanoke River. This sandy floodplain site is periodically mowed; during the intervals it is in an early successional stage dominated by little bluestem grass (*Schizachyrium scoparium* [Michaux].), several species of *Rubus*, and a host of composites. Although this trap was maintained for over a year, no other specimens were captured, nor were any taken in a similar trapline placed a few yards further away from the river's edge. This site is located in the central Virginia Piedmont, about 140 miles (225 km) inland from the Dam Neck locality, and only four miles (six km) from the North Carolina state line.

During sorting of the pitfall sediments, the mirids were conspicuous, despite their small size, by the bright crimson eyes. The generic name is very appropriate, if in fact not an understatement, being the Greek word meaning "little" or "small". *T. alboornatus*, at 1.0 mm in length, is surely the smallest Virginia species of mirid and rivals *Ceratocombus vagans* for the title of our smallest heteropteran.

ACKNOWLEDGMENTS

Dr. Thomas J. Henry (USDA-ARS-SEL) kindly identified *Tytthus alboornatus* and *Teratocoris discolor* and provided information concerning *Ceraleptus americanus*. VMNH is in the debt of Dr. Barbara J. Abraham for donating the specimens of *Lophoscutus prehensilis*, and of Dr. Steven M. Roble for ongoing transfers of massive VDNH collections, including the Wallops Island material collected by C. S. Hobson.

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Amphibian Diversity in Three Montane Streams with Different Levels of Acidity, Shenandoah National Park, Virginia

Joseph C. Mitchell

Department of Biology
University of Richmond
Richmond, VA 23173

INTRODUCTION

The Blue Ridge Mountains are potentially sensitive to acid deposition derived from human sources, particularly burning of fossil fuels (Galloway & Cowling, 1978; Ryan et al., 1989; Webb et al., 1989). Because acidity levels are expected to increase in the eastern United States in the foreseeable future, acid deposition may increase in this region (Galloway et al., 1983). In Shenandoah National Park (SNP), surface runoff alkalinity concentrations are generally low throughout,

indicating a potential sensitivity to increases in acidic atmospheric precipitation (Lynch & Dise, 1985). The pH of precipitation during pre-industrial times was ≥ 5.0 but has since decreased to a mean annual pH of 4.2 (Camuto, 1991). Increasing acidity causes changes in the chemistry of soils and aquatic systems and can have dramatic effects on the local fauna.

Biotic responses to increases in acidity in the Blue Ridge mountains have been studied for only a few taxonomic groups. Aquatic invertebrate abundance and species richness were significantly lower in montane